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**BP MINERALS AMERICA**

June 10, 1988

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DIVISION OF  
OIL, GAS & MINING

Mr. Lowell P. Braxton  
Administrator,  
Mined Land Reclamation Program  
Utah Division of Oil Gas and Mining  
355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203

Dear Mr. Braxton:

The following is Kennecott Explorations (Australia) Ltd's (Kennecott) response to the Division of Oil Gas and Mining's letters of May 13 and May 25. These letters were the Division's response to the recently submitted revised Notice of Intent to Commence Mining Operations at Barney's Canyon (NOI). All of the enclosed material will be included in revision's to the NOI which will be completed as soon as possible along with our reclamation cost estimate for bonding purposes. Based upon our meetings with Mr. Wayne Hedberg and Mr. Holland Shepherd on Thursday, June 9., we believe that the DOGM's remaining outstanding concerns with the NOI have been resolved and that the technical response comments presented below document this agreement. We understand that upon confirmation of said resolution and prior to the completion of the final changes to the NOI that the Division is prepared to issue tentative approval and publish requests for public comment. We request that this approval and publication be issued as soon as possible.

The responses presented below are in the order in which the comments were posed in the Division's letters of May 13 and May 25.

Responses to the May 13 letter are as follows:

Topsoil Management, Section 3.9 Page 83

ok  
HOS  
Kennecott will apply the permanent reclamation seed mix to those topsoil stockpiles or parts of topsoil stockpiles which will not receive future contributions of topsoil. Stockpile surfaces that will receive additional topsoil as part of ongoing mine expansion will be vegetated with the interim seed mix. Upon completion of establishment of each stockpile, the entire exposed topsoil surface will have been revegetated with the permanent seed mixture.

Overburden Disposal, Section 3.10, page 84-86

The old landslides have been evaluated further by Sergeant Hauskins and Beckwith and found to be stable. A copy of their report was submitted to Division staff during the June 9 meeting. The NOI will be appropriately modified to reflect the results of SHB's work.

Evaluation of Material Toxicity, Section 3.11, Pages 86-90.2

ok  
HWS  
The only significant sulfide mineral present in the ore and waste at Barneys Canyon is pyrite. Pyrite in quantities sufficient to generate significant acid will be readily identifiable by visual means. In addition, as part of gold assaying for mine ore grade control, the mine analytical laboratory will determine not only gold content but also whether or not the ore and adjacent rocks are sulfide-bearing or oxidized. The laboratory analyses will be performed on the closely spaced mine blast holes. The mine geologist or other person responsible for ore grade control in the pit will be responsible for delineating and marking the pyritic waste rock in the pit throughout the life of the mine. During overburden removal, pyrite-bearing waste will be identified both from the blast hole analytical results and by visual means, marked with flags and loaded in separate trucks for haulage to the waste dump where it will be dumped such that non-sulfidic waste can later cover it. If necessary at the end of installation of a dump, non-sulfidic waste rock will be stockpiled on the top of the dump for use as final cover material for sulfide-bearing rock. The thickness of non-sulfide-bearing waste rock cover will be no less than two feet.

ok  
HWS  
Kennecott is in the process of developing for the Bureau of Water Pollution Control (BWPC) responses to that Bureau's comments on the BWPC NOI. Kennecott will establish a sampling procedure for decommissioned heaps which will satisfy both BWPC and DOGM and include a description of this procedure in the final NOI to both agencies.

Critical Wildlife Habitats, Section 4.4, Page 104

The Division of Wildlife Resources (DWR) has expressed concern for both elk calving habitat impact and deer and elk winter range impact by the Barneys Canyon project. During a field meeting at Barneys Canyon with Messrs. Kendall Nelson and Walt Fitzgerald of the DWR on Thursday, May 26, it was agreed that the project operations themselves would not adversely affect elk calving habitat. The only mitigation necessary for protection of this habitat would be to reduce travel in the main fork of Dry Creek and to that portion of Barneys Canyon above the 7000 foot elevation as much as possible during the calving season. Neither Mel-Co nor

Barneys Canyon operations will require access to these areas; therefore, Kennecott agrees to this means of mitigation. Kennecott cannot, of course, restrict access to private landowners or lease holders who may require access to properties in these canyons or to its own personnel who may have to enter the main fork of Dry Creek for purposes of property maintenance or water monitoring.

ok  
HWS  
Deer and elk winter range occurs throughout the Barneys Canyon Pit, dump, and processing areas. The DWR personnel agree that no mitigation of the impacts to deer winter range is possible during operations; however, they both agreed that because the mine life is short and the reclamation plan calls for complete revegetation of the heaps and dumps, that overall project impact on deer and elk winter range is acceptable. The DWR is preparing a letter that will describe the results of the field visit, the agency's revised understanding of the project, and its opinion regarding the impact of the project on wildlife in the area.

Soils and Revegetation, Sections 5.4-5.8, Pages 110-118

ok  
HWS  
Kennecott commits to placement of one foot of topsoil on all disturbed slopes having an outslope of 2h/1v or less. A revegetation test plot program, designed to determine if the Mel-Co dump material can be directly revegetated will be developed; however the design of this program will not be included in the mining and reclamation plan at this time.

ok  
HWS  
Kennecott will use the Division's recommended methodology for hydroseeding the steep, non-topsoiled slopes of the Mel-Co 7100 and 7200 slopes. These slopes will be hydroseeded in two steps. The fertilizer and two-thirds of the seed mix will be applied first; then, in the second application, the remaining one-third of the seed and the hydromulch will be applied. A tackifier will be used to hold the seed in place after drying. Kennecott prefers to retain the existing proposed seeding method for the regraded, topsoiled 2h/1v slopes. It is proposed that the seed and fertilizer be applied in one application and that the mulch be blown onto the slope surfaces. The mulch will then be crimped into the slope using a Snow-Cat-type vehicle with cleated tracks. These vehicles are light-weight and will not excessively compact the soil, yet the cleated tracks will crimp the hay mulch into the soil.

Variance Request - Highwalls, Section 6.3, Page 125.

The granting of the variance request for pit high walls at 47 degrees is noted. The approval of the variance request for pit topsoiling and revegetation is granted in the Division's May 25 letter.



Variance Requests, Section 6.2, 6.5, and 6.7, Pages 124-127.  
Kennecott agrees to the reclamation modifications suggested by DOGM for the un-regraded and non-topsoiled 7100 and 7200 dump out slopes at Mel-Co. Regarding the dumps slope stability, Sergeant, Hauskins, and Beckwith have determined that the dumps are stable under static and dynamic conditions. The results of their analysis are included in the report submitted to the Division in the June 9 meeting. The discussion in the NOI on mine dump stability will be expanded to reflect the results of SHB's work.

ok  
HHS  
In order to improve the reclamation of the un-regraded Mel-Co dumps, Kennecott responds to the Division's reclamation proposals as follows:

- (1) Benches will be constructed every one hundred vertical feet along the dump out slopes at the commencement of reclamation. These will allow access for the hydroseeder and help to control slope erosion.
- (2) A mixture of shrub tube stock, including gambel oak and other species determined in cooperation with the Division will be planted in clumps of 3 to 5 each at a rate of 135 plants per acre, three times the application rate proposed for the topsoiled surfaces. The planting procedure for each clump will begin with excavation of an over-sized hole which will be lined with mulch. A slow-release fertilizer pellet will be placed at the bottom of each hole. The tube stock will be then planted and the hole filled and tamped. A mixture of legume seed will be hand-applied to the surface of each planting site for enhancement of nitrogen development in the planting medium.
- (3) Kennecott understands that the Division will establish a survival rate, as a percentage of total seedlings planted, for the un-topsoiled dump surface. This survival rate is currently estimated anticipated to be 60 percent. Kennecott agrees to commit to achievement of this survival rate at the end of the three-year period following completion of reclamation.
- (4) Kennecott understands that the need for topsoil on the tops of benches cut into the dump out slope will be determined based upon the success of revegetation test plot work on the dumps that will be conducted during mine operations. Kennecott will stockpile sufficient additional topsoil to handle this possible need. The benches will be topsoiled only if the revegetation test plot program indicates that direct revegetation of dump materials will not be successful.
- (5) To the extent possible the dump out slope size will be minimized by confining waste as close as possible to the Mel-Co pit in the drainage occupied by the 7100

- good  
HWS
- (4) dump and by minimizing, to the extent possible the amount of waste rock placed on the 7200 dump. It is not possible to reduce the size of the Mel-Co pit. As a result of discussions with DWR personnel, it has been agreed that additional legumes and forbs will be added to the revegetation seed mix to improve the spring forage for deer and elk in the reclaimed areas of the project. DWR personnel feel that the addition of these species to this large reclaimed area will significantly improve the early spring forage above what is currently present. This improved forage over this large reclaimed area will provide enhanced habitat to both deer and elk. Therefore, the current reclamation plan with the modified seed mix is, according to DWR, the best means of enhancing the post-mining use of the reclaimed area.

Responses to the May 25 letter are as follows:

1. The correct combined capacity of the pregnant and barren solution ponds is 10,000,000 gallons. This will be revised in the text of the application.
2. Based on information contained in the Lark, Utah U. S. G. S. 7.5 minute topographic quadrangle, Barneys Creek is perennial along a two mile reach beginning roughly at the mouth of Barneys Canyon and extending to the confluence with the unnamed drainage from which Bancroft Spring emanates. There is no spring source for this perennial reach. A water rights investigation revealed that no water rights have been filed on the water flowing along this stretch of Barneys Creek. Flow measurement or water quality analysis has not been performed on Barneys Creek.

The potential impacts to Barneys Creek from the proposed mining facility will be caused mainly from haul roads and the Barneys Canyon Pit. The largest potential impacts to Barneys Creek will be from the erosion of haul road fill material during construction increasing sedimentation rates into the live stream channel. This impact should be of short time frame. Other impacts due to haul road placement includes either degradation or aggradation of the stream channel from installation of the culverts through which Barneys Creek will flow. Riprap will be placed in the stream channel for a distance of 15 feet up-gradient and down-gradient of the culverts to be placed in Barneys Creek. Riprap will also be placed for a vertical distance of 3 feet along the stream banks through this section as well as on the roadfill slopes adjacent to the culverts. Any additional sediment loads entering the stream channel will

be impounded behind the railroad impoundment downstream and will not leave B. P. Minerals property. Due to the location of this impoundment, water quality stream flow monitoring is not planned. There will be no impacts to Barneys Creek from Barneys Canyon open pit due to the concavity of the pit opening preventing any discharge from occurring.

Bancroft Spring appears to result from the interception of subsurface, infiltrating flow in alluvial fill being intercepted by a buried occurrence of quartz latite which occurs at the location of the spring. Flow rates from this spring have been estimated at 30 gallons per minute, though the consistency of this flow rate is unknown. Aquifer recharge from this spring is probably low due to the low permeability of the volcanic aquifer. Aquifer recharge from Barneys Creek will also be small again due to the low permeability of the volcanic material in which the aquifer is contained.

3. On all future monitoring or water wells drilled in the Barneys Canyon project area, pump tests or packer tests will be performed to provide additional information on the hydraulic characteristics of the underlying aquifer.

4. Figures 3.4-1 and 3.4-2 and any additional diagrams currently incorrect will be updated to reflect the most recent revised design considerations.

5. Revisions will be made to the text concerning the removal of the upper layer of solution collection pipes on top of the liner blanket.

6. The baseline water quality section will be revised to refer the reader to Appendix B for water quality data now available for Bancroft Spring.

7. The text will be revised to reference two pairs of solution ponds rather than the three currently described in the report.

8. Design changes in the leach pad liner will be updated in the text.

9. The arrow showing the free flow of water through railroad impoundment S was unintentionally not included on Reclamation Treatments Map, Plate VI. This culvert will be reopened upon reclamation if found to be structurally sound and allowed to flow unhindered through this embankment.

10. Impoundment P<sub>2</sub> does have an existing culvert at the base of the railroad embankment which will be plugged during project operations. This culvert will be reopened if found structurally sound for the free flow of water beneath the impoundment upon reclamation. The drop inlet standpipe as originally designed has been removed. The additional impoundment capacity contained in impoundment P<sub>1</sub> does not now warrant the need for a drop inlet pipe in P<sub>2</sub> since the capacity is sufficient to contain the 100-year, 24-hour runoff volume.

11. Railroad impoundments R and S do not have the capacity to contain the 10-year, 24-hour runoff event as calculated by the Curve Number Method. Drainage basin R is located along the northern border of the project area and will have minimal disturbance by the proposed project. The disturbances include the fill slopes created by the leach pads and a small portion of mine dump 6400 located at the headwaters of the drainage. Since this drainage will remain largely undisturbed, engineering "improvements" are not recommended for this impoundment. The dam currently shows no signs of historic overflow nor does the impoundment area show signs of water containment.

The drainage area of impoundment S will be reduced due to drainage modifications of the mining facility. The railroad fill dam for impoundment S does not appear have ever been overtopped by runoff water nor are there signs of water impoundment. It is therefore recommended to refrain from installing engineering improvements.

Both impoundments R and S will contain the 10-year, 24-hour runoff event provided the spillway culverts now in place were plugged. The freeboard remaining after containment of this event would be less than five feet for both dams and would increase the chance of dam failure due to the decreasing structural integrity of the dam as the dam width narrows near the crest. A drop inlet spillway is not recommended due to the safety hazard of free standing water near the dam crest.

12. The drainage area up-gradient of impoundment T is 37.8 acres and will remain largely undisturbed except for the area to be used for administration. Due to the minimal disturbance within this watershed, a stage capacity curve and runoff estimates were intentionally not included in the application. Runoff volume estimates and a stage capacity curve have since been calculated and will be included in the text and Appendices where other impoundments are referenced.

13. a) The table in Appendix D1 is incorrect. The correct capacity of impoundment Q is 26 AF as presented in the text. This is based on the assumption that the spillway culvert is 10 feet below the dam crest and water will not pond above the lower elevation of the culvert due to runoff through the culvert.

b) Both capacities as specified are incorrect. Based again on the assumption given above, the containment capacity of impoundment R is 6 AF. The impoundment capacity of 22 acre-feet included the full freeboard height. The capacity referenced 11.3 acre-feet included the area up to 5 feet below the dam crest. This capacity and all others referenced will be based on the assumptions presented in number 13a above.

c) The correct return period runoff event is the 100-year, 24-hour event. This typographic error will be corrected in the text.

d) Impoundment K no longer exists due to the new configuration of mine dump 6280. This revision will be made in the text.

e) The S & K in the impoundment Containments Volumes Summary Table refers to the drainage basins contributing to runoff to be contained in Impoundment S. Impoundment S is the only containment structure referred to here.

For an explanation of design criteria for impoundment S, see number 11. Silt fences will be placed in the channel just down-gradient of mine dump 6280 to contain the sediment likely to be originating from the disturbed areas above. Therefore, the only additional sediment loads will be from the access road fill slopes connecting the administrative area to the Barneys Canyon Pit.

14. The culverts will be placed along the natural channel gradient to minimize erosion as opposed to a drop outlet configuration. Since many of the haul and access roads will be excavated into bedrock especially at Mel-Co, channel scour down-gradient of the culverts will be minimal. In those areas where bedrock is below the channel bottom, outlet protection measures such as riprap installation will be used as necessary.

15. Impoundment S drainage area will be reduced by 14 percent. This typographical error will be revised in the text.



16. All intercepted pit water will be utilized as necessary for dust control on the roads, and for makeup water as necessary. Water rights will be filed with the Division of Water Rights for the volume of water to be used during operations. In inflow to the pit yields more water than can be used during operations, this water will be discharged into a nearby drainage where the water will impound behind the railroad impoundments on the eastern edge of the property. The water will infiltrate into the ground behind the grade. No discharge permit will be needed as this water will not leave the property. The very low permeability of the volcanics in which the aquifer is contained indicate the volume of water removed from the pit during pumping should be manageable.

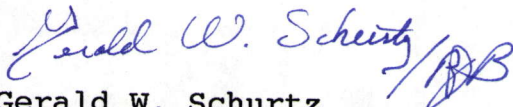
17. Line one on page 120 will be revised to read "A trapezoidal diversion channel will be constructed to carry water from Drainage M, straight down the hillside into the reopened drainage channel J.

18. BP Minerals understands that all updated design changes and plans required and approved by the BWPC must be submitted to the Utah Division of Oil Gas and Mining as amendments to the application.

All changes to the NOI will be made using replacement pages and the inconsistencies in the plan that have been pointed out in the Divisions's letters of May 13 and May 25 will be rectified.

Please call Mr. R. Bayer or Mr. R. Pole at JBR Consultants Group (943-4144) should you have questions regarding this letter.

Sincerely,



Gerald W. Schurtz  
Manager Environmental Affairs

cc: Mr. Wayne Hedburg/DOGM  
Mr. G.H. Boyce/Kennecott  
Mr. R.J. Bayer/JBR  
Mr. R. Pole/JBR